# UML 2 Foundation Exam Overview

<table>
<thead>
<tr>
<th><strong>Exam Series Code</strong></th>
<th>OMG-OCUP2-FOUND100</th>
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<tbody>
<tr>
<td><strong>Exam Duration</strong></td>
<td>120 minutes in English-speaking countries and 150 minutes in all others.</td>
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<td><strong>Exam Fee</strong></td>
<td>US$250 (or local equivalent) in English-speaking countries and US$260 (or local equivalent) in all others.</td>
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<tr>
<td><strong>Exam Type</strong></td>
<td>Multiple choice (text and UML diagrams)</td>
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<tr>
<td><strong>Exam Pass Score</strong></td>
<td>&gt;=60 of 90 questions answered correctly (&gt;=67%)</td>
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<tr>
<td><strong>Exam Prerequisite(s)</strong></td>
<td>None</td>
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<tr>
<td><strong>Exam Specification</strong></td>
<td>Unified Modeling Language (UML) v.2.5.1</td>
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| **Recommended Exam Study Guides** | 1. OCUP 2 Certification Guide: Preparing for the OMG Certified UML 2.5 Professional 2 Foundation Exam (Chonoles) *Includes practice questions by the exam designer.  
2. UML 2.0 in a Nutshell (Pitman)  
3. UML 2 for Dummies (Schardt) |
| **Exam Training Required** | None |
| **Exam Training Options (not required)** | inprogress (Poland: 2 and 3-day courses)  
NobleProg (Canada, China, Germany, India, North America, Poland, UAE and UK)  
oose (Germany: 1-day course and 5-day course)  
RedPill (Poland: 2-day course) |
| **Exam Voucher Program** | Visit the Pearson VUE Voucher Store for a 10% discount/10 vouchers or view our Voucher Program for greater discounts. Vouchers expire one year after purchase and can be transferred. Contact Pearson VUE to honor a previously purchased voucher price. |
| **Testing Accommodations** | For a hearing, learning, physical or visual disability accommodation, please contact certification@omg.org for instructions on testing accommodations before registering for an exam. |
| **Exam Registration** | Pearson VUE: create an account, locate a test center, view available tests, (re)schedule a test (online or at a test center), cancel your exam (contact Pearson VUE >=24 hours prior to exam for a full refund or you forfeit the full exam price), view exam scores and Contact Pearson VUE (for any technical issues). |
| **Online Exam Check-In & Requirements** | Visit Pearson VUE Online Proctoring for detailed info. Log in at least 30 minutes early (online verification may take 15–20 minutes). Late arrivals will not be allowed to take the exam. |
| **Test Center Check-In & Requirements** | Arrive at least 30 minutes early. Late arrivals will not be allowed to take the exam. Bring two forms of ID (at least one with photo and both with signature): alien registration card, bank card, credit card, employee badge, government issued, green card, military, passport, school and state ID. Do not bring any items (personal or otherwise) other than the two forms of ID to a test center. Pearson VUE Test Center Coronavirus Guidelines |
| **Exam Languages** | This exam is offered in English. Individuals cannot use a translation app during the exam. |
| **Review Your Answers** | Before completing an exam individuals will be presented with a screen to review answers to all questions. |
Exam Score Reports
Pass or fail, individuals will be provided with a score report on computer screen immediately following the exam whether on-site at test center or online. A hardcopy will be provided before an individual leaves a test center with their score in each major section. If an individual fails, they can review those sections where they scored poorly to assist them when they decide to retake the exam. Individuals can also review their exam score reports via their Pearson VUE account.

Certification Digital Badges
Those who pass their exam will immediately receive an email from Credly (check Junk folder) to claim their verifiable digital badge. Credly provides certified professionals with the option to share their certification credentials with others via the Credly Network, social media, .pdf or hardcopy certificate, and other avenues.

Certification Expiration
Certifications expire 5 years from the date the exam was passed. The same or a higher-level certification must be taken prior to the previous certification's expiration date to extend a certification.

Retaking the Exam
Contact certification@omg.org to request a 30% discounted exam retake voucher.

Original UML Certification
While the original UML certification is still recognized by some, the UML 2 certification will demonstrate modeling knowledge and skills required in today's complex IT environment.

Still Have Questions?
certification@omg.org

General Areas Tested in the UML 2 Foundation Exam

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<tr>
<th>Area</th>
<th>Percentage</th>
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<tr>
<td>Class Diagram</td>
<td>25%</td>
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<tr>
<td>Activity Diagram</td>
<td>20%</td>
</tr>
<tr>
<td>Sequence Diagram</td>
<td>15%</td>
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<tr>
<td>Why We Model</td>
<td>15%</td>
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<tr>
<td>State Machine Diagram</td>
<td>10%</td>
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<tr>
<td>Object Diagram</td>
<td>5%</td>
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<tr>
<td>Package Diagram</td>
<td>5%</td>
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<tr>
<td>Use Case Diagram</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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Comprehensive Areas Tested in the UML 2 Foundation Exam

<table>
<thead>
<tr>
<th>Classification</th>
<th>Common Structure</th>
<th>Packages</th>
<th>Simple Classifiers</th>
<th>Structured Classifiers</th>
<th>Values</th>
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<td>BEH</td>
<td>Actions</td>
<td>Activities</td>
<td>Common Behavior</td>
<td>Interactions</td>
<td>State Machines</td>
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**STRUCTURAL DIAGRAMS**
- AggregationKind (Composition, Aggregation)
- Behavioral Feature
- Feature
- Generalization
- InstanceSpecification
- Operation
- Parameter
- Property
- Slot
- Structural Feature

**VALUES**
- LiteralBoolean
- LiteralInteger
- LiteralNull
- LiteralReal
- LiteralString
- LiteralUnlimitedNatural
- OpaqueExpression
The following serves mainly as a basis for description of the UML 2 Intermediate exam and the UML 2 Advanced exam coverage and is not required for the UML 2 Foundation exam. It is not required, but if you wish, please refer to the Unified Modeling Language (UML) v. 2.5.1 specification for a more in-depth look at the corresponding chapters and sections cited below.

CHAPTER 6: GENERAL TOPICS

Abstract Syntax

- Every first-level subsection of the UML specification starts with a UML diagram labeled Abstract Syntax. The OCUP 2 exams do not ask about these diagrams explicitly, but they are good examples of the language you're studying(!) and represent the relationships linking the elements to be presented in the sections that follow in a particularly clear and concise way. Learn to read them - this will provide an advantage to your study.

CHAPTER 7: COMMON STRUCTURE

- 7.2 Root concepts - All
- 7.3 Templates - Templates are Excluded from Foundation and Intermediate levels; Templates and the many elements that support them will be covered at Advanced level only. This exclusion encompasses elements and attributes defined for Templates here and later on (String Expressions and Name Expressions, e.g.; most have "Template" somewhere in their names). There are many of these scattered throughout the specification but we will not point out on the Foundation and Intermediate Coverage Maps, for each one, that it is excluded. This exclusion applies even within subsections denoted "All" in the coverage list.
- 7.4 Namespaces - All except as noted below:
  - Except: ownedRule constraints, nested nameSpaces, circle-plus notation, ElementImport
  - Except: StringExpression (used in Templates) and nameExpression
- 7.5 Types and Multiplicity - All except Cardinality, isOrdered, isUnique, multiplicity string
- 7.6 Constraints - All except owner
- 7.7 Dependencies - All except Usage, Abstraction, Realization

CHAPTER 8: VALUES

- 8.2 Literals - All
- 8.3 Expressions
CHAPTER 9: CLASSIFICATION

- 9.2 Classifiers
  - 9.2.3 Semantics
    - Classifiers: All Except the mentioned relations to Collaboration and UseCase
    - Generalization: All Except the detail in this section about Substitutability

- 9.4 Features
  - 9.4.3 Semantics
    - Features: All
    - Structural Features: All Except execution scope, isReadOnly
    - Behavioral Features: All Except concurrency
    - Parameters: All Except the effect property, redefines (ParameterSet is not covered in OCUP 2)

- 9.5 Properties
  - 9.5.3 Semantics
    - Includes Property as an attribute of a Classifier and as the parts of Structured Classifiers; context for the Property; basic definition of derived Property (isDerived=true); aggregation Except details about composite aggregation
    - The semantics of the defaultValue, isStatic, and isDerived properties will be covered in more detail at Intermediate level, but their notation and basic aspects (that is, the syntax) are covered at Foundation level

- 9.6 Operations
  - 9.6.3 Semantics
    - Operations: Includes basic definition including return Parameter

- 9.8 Instances
  - 9.8.3 Semantics
    - All except InstanceSpecification partially representing the instance it corresponds to, classification of the instance by zero or more than one Classifier, type restrictions on a defining ValueSpecification, and snapshots

CHAPTER 10: SIMPLE CLASSIFIERS

- 10.2 DataTypes - All
- 10.3 Signals - Signals and Receptions will be covered in this exam as used in Sequence diagrams; see Chapter 17. The semantics covered in this chapter will be covered at Intermediate level.
- 10.4 Interfaces
  - 10.4.3 Semantics - All except ownership of a ProtocolStateMachine.

CHAPTER 11: STRUCTURED CLASSIFIERS

- 11.4 Classes
  - 11.4.1 Summary
    - Include purpose of a class. NOTE: The summary also points out that "Class is the concrete realization of EncapsulatedClassifier and BehavioredClassifier". Although this metamodel-based aspect will not be tested explicitly until Advanced level, it provides much insight to candidates who take the time to understand what it means, and what it indicates.
  - 11.4.3 Semantics
• Classes: *Includes* Basic aspects of Class. *Excludes* detailed aspects of, e.g., attributes, namespace, isActive, which will be covered at Intermediate level.

- 11.5 Associations
  - 11.5.1 Summary: *Excludes* AssociationClass
  - 11.5.3 Semantics
    - Associations: *Includes* basic aspects of Associations, including composite aggregation, navigability. *Excludes* Associations with more than two memberEnds, Association defining a collection, subsetting, specialization, navigableOwnedEnd, qualifier, derived Association

**CHAPTER 12: PACKAGES**

- 12.1 Summary: *All Except* Profiles, which will be covered at Advanced level
- 12.2 Packages
  - 12.2.3 Semantics
    - Package: *Includes* basic definition. *Excludes* merging, specifying the URI.
    - Package Merge: NOTE that *Package Merge* is *Not* covered in OCUP 2 at any level.
    - NOTE: For more on packages, download the White Paper *Model Organization with Packages and the Package Diagram* in the references section of the Primary Coverage Map page.

**CHAPTER 13: COMMON BEHAVIOR**

- 13.2 Behaviors:
  - 13.2.3 Semantics:
    - Behaviors: *All Except* behavior as a class, reentrant.
    - Behavior Parameters: *All Except* defaultValue. *Includes* streaming at awareness level only. *ParameterSets* are not covered in OCUP 2.
    - Behavioral Features and Methods: *Includes* Operations and Receptions; excludes method, context, resolution process
- 13.3 Events
  - At Foundation level, Events are treated in the context of specific diagrams (sequence, activity, state machine, primarily). Detailed aspects of Events (and of Behaviors in general), described in Section 13.3 and its subsections, will be covered at the Intermediate and Advanced levels.

**CHAPTER 14: STATEMACHINES**

- StateMachine coverage at Foundation level:
  - StateMachine coverage at Foundation level includes only the single-region Behavior State Machine. All aspects of this StateMachine are included *Except* the following:
    - specification of a method of a behavioredClassifier (that is, an Operation or Reception corresponding to a BehavioralFeature); regions; encapsulated composite States; submachine States; history (deep or shallow); deferred events and the event pool; the pseudostates join, fork, entrypoint, exitpoint, and terminate; transition kind=local; high-level (group) transitions; conflicting transitions; firing priorities;transition selection and execution sequence; StateMachine redefinition; and ProtocolStateMachines.
  - Also *Excluded* is the alternative graphical representation illustrated in Figure 14.32.

**CHAPTER 15: ACTIVITIES**
15.2 Activities

- 15.2.1 Summary: All
- 15.2.3 Semantics:
  - Activities: Includes the Token model - object tokens and control tokens - but Excludes object tokens over ControlFlow edges and isControlType, which will be covered at Advanced level. Also Excludes the null token, token movement details resulting from offer and acceptance, named edges, Activities as classes.
  - Activity Nodes: All Except concurrent execution, and one token offered to multiple targets
  - Activity Edges: All Except object tokens passing over activity edges, contention, weight, token ordering.
  - Object Flows: Include the basic definition of Object Flow.
  - Activity Execution: Include precondition and postcondition constraints.

15.3 Control Nodes

- 15.3.3 Semantics
  - Initial Node: All Except additional concurrent flows and CentralBufferNodes
  - Final Nodes: All Except isSingleExecution
  - Fork Nodes: All Except handling of unaccepted token offers
  - Join Nodes: All Except joinSpec and isCombinedDuplicate
  - Merge Nodes: All
  - Decision Nodes: The basic behavior of Decision Nodes is covered at this Foundation level, but the distinction between the decisionInputFlow and the primary incoming edge is Not covered until Intermediate and Advanced.

15.4 Object Nodes

- 15.4.1 Summary: All Except CentralBufferNodes and DataStoreNodes
- 15.4.3 Semantics:
  - Object Nodes: Includes Basic token input and output.
  - ActivityParameterNodes: All Except ordering

15.5 Executable Nodes

- 15.5.3 Semantics
  - Executable Nodes: All Except isControlType, multiple concurrent executions

### CHAPTER 16: ACTIONS

- 16.1 Summary: Includes the basic definition of Action as contained in Activities.

16.2 Actions:

- 16.2.3 Semantics
  - Actions: Includes basic definition of Action including input and output on pins, and localPrecondition and localPostcondition. Excludes context BehavioredClassifier, StructuredActivityNodes, streaming, multiple instances, non-locally-reentrant and non-reentrant behavior, and effects of violations of localPrecondition and localPostcondition.
  - Opaque Actions: All Except interpretation of body strings
  - Pins: Includes basic definition of input and output pins, ordering (basic aspects only), multiplicity. Excludes multiplicity requirements on output pins for termination, ValuePins, ActionInputPins.
  - Pins: All Except attributes ordering and isOrdered (NOTE: At Foundation level, values on a pin may be ordered but the exam will not link this causally with a value of either of these attributes), StructuredActivityNodes and pins during execution, multiplicity requirements on output pins for termination, ValuePins, ActionInputPins

16.3 Invocation Actions

- 16.3.3 Semantics
• Call Actions: Includes CallAction, basic definition. CallBehaviorAction, CallOperationAction
• Send Actions: Includes basic definition, SendSignalAction.

16.10 Accept Event Actions
  o 16.10.1 Summary: All
  o 16.10.3 Semantics
    ▪ Accept Event Action: All
    ▪ Accept Call Actions: Definition, Pins, triggering and basic returning values. Excludes triggering by an asynchronous call, method behavior caveat

CHAPTER 17: INTERACTIONS

• 17.1 Summary
  o 17.1.1 Overview: General uses as discussed, trace, allowed and disallowed traces (but disallowed or invalid traces will be tested at Advanced level only), discussion relating to sequence diagrams.
  o 17.1.2 Basic Trace Model: All Except Interaction equivalence
  o 17.1.3 Partial ordering constraints on valid and invalid traces: All Except coregion or parallel operator effect
  o 17.1.4 Interaction Diagram Variants: The Sequence Diagram is tested at Foundation level. The Communication Diagram will be tested at (this) Intermediate level. The Interaction Overview Diagram will be tested at Advanced level. Neither the Timing Diagram nor Interaction Tables will be tested in OCUP 2.

• 17.2 Interactions
  o 17.2.3 Semantics
    ▪ Interactions: All Except generalizing, redefining, and specializing an Interaction, and use of a formal Gate
    ▪ Occurrence Specifications: All
    ▪ Execution Specifications: All

• 17.3 Lifelines
  o 17.3.3 Semantics
    ▪ Lifelines: Includes definition and use of Lifelines in modeling Except local ordering. Parallel combined fragment will be tested at Intermediate level, and coregion will be tested at Advanced.

• 17.4 Messages
  o 17.4.3 Semantics
    ▪ Messages: Includes signature as Operation or Signal, messagesort.
    ▪ Message Ends: All
    ▪ Message Occurrence Specifications: All
    ▪ Destruction Occurrence Specifications: All
    ▪ Gates: MessageOccurrenceSpecifications ordering rules

• 17.5 Occurrences
  o 17.5.3 Semantics
    ▪ Action Execution Specifications: All
    ▪ Behavior Execution Specifications: All
    ▪ Execution Occurrence Specifications: All

• 17.6 Fragments
  o 17.6.3 Semantics
    ▪ Weak Sequencing: All

• 17.8 Sequence Diagrams
  o Introduction: All
    ▪ 17.8.1: Sequence Diagram Notation
CHAPTER 18: USECASES

18.1 UseCases
   18.1.1 Summary: All Except technical definition of instance
   18.1.3 Semantics
      - Use Cases and Actors: All Except UseCase as BehavioredClassifier; description through a
        Collaboration; being owned by a Classifier.
      - Extends: All Except ownership of the extend relationship; extensionLocation
      - Includes: All Except Include being a kind of NamedElement

CHAPTER 21: PRIMITIVE TYPES

21.1 Summary: All
21.2 Semantics: All